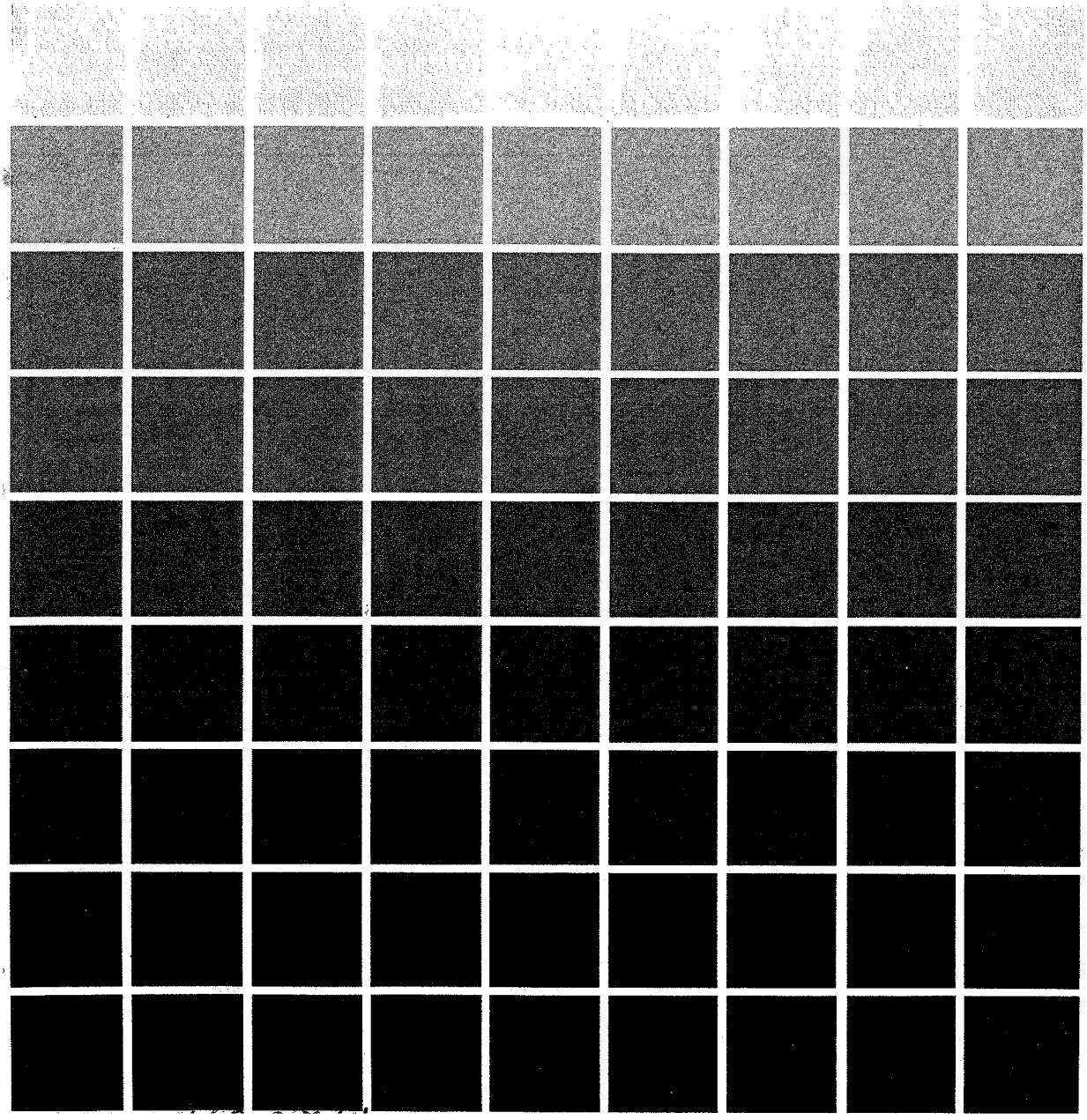
Bedienungsanleitung
Operating instructions
Mode d'emploi
Istruzioni per l'uso
Gebruiksaanwijzing
Bruksanvisning
Betjeningsvejledning
Käyttöohje
Instrucciones de manejo

GRUNDIG
PS 2000

DIN 45500
HIGH FIDELITY



Deutsch Seite 1

Bitte klappen Sie beim Lesen der Bedienungsanleitung die Seite 34 aus

English Page 5

Keep page 34 open when reading the Operating Instructions

Français Page 8

Déplier la page 34 en lisant le mode d'emploi

Italiano Pag. 12

Durante la lettura delle istruzioni per l'uso aprite la pagina 34.

Nederlands Pag. 15

Sla bij het lezen van de gebruiksaanwijzing pagina 34 uit

Svenska Sida 18

Vik ut sida 34 när Ni läser bruksanvisningen

Norsk Side 21

Hold side 34 åpne når bruksanvisningen leses

Dansk Side 24

Hold side 34 opslået, mens De læser brugsanvisningen

Suomi Sivu 27

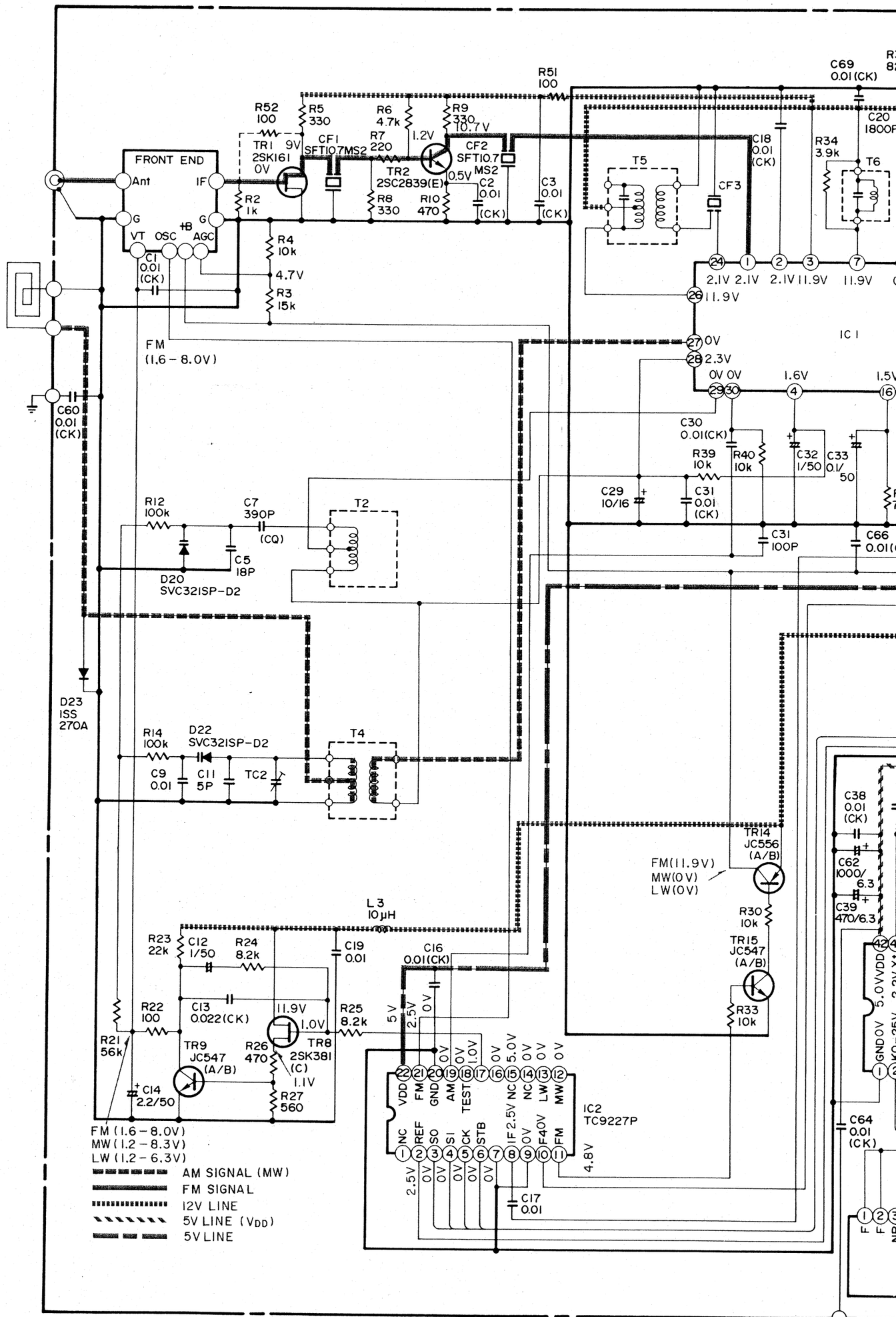
Pida sivu 34 auki tutustuessasi käyttöohjeeseen

Español Pág. 30

Mantenga abierta la página 34 cuando lea las instrucciones de manejo

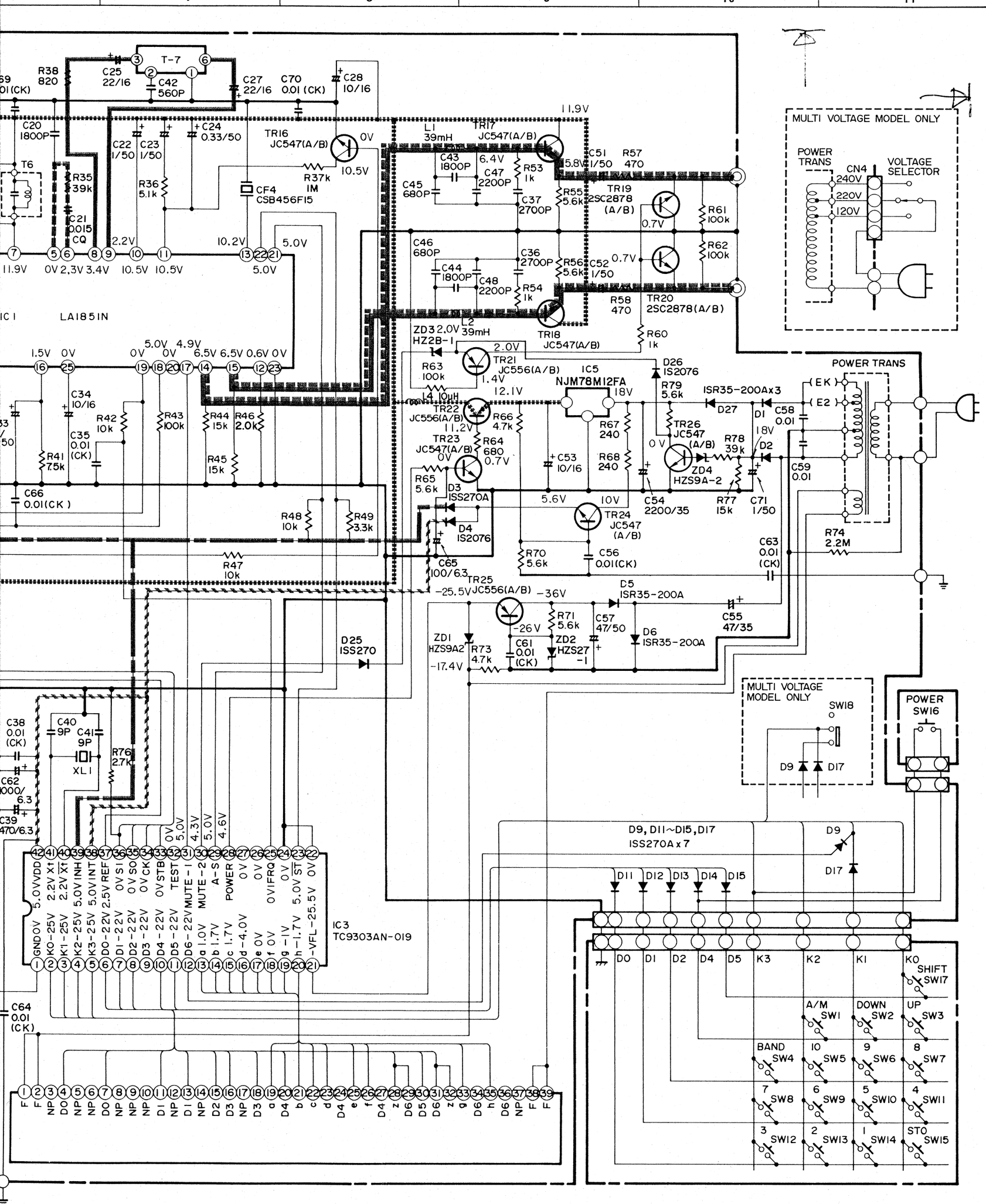
SCHALT PLAN (für 2 Band Typ.)

1 | 2 | 3 | 4 | 5 | 6



TU260	Model Name	Tuner Unit
2 Band	Black for European	1U-2025
	Gold for European	1U-2025
	Black for Canada	1U-2025B
	Black for Multi Voltage	1U-2025E
	Black for Australia	1U-2025F
3 Band	Black for European	1U-2025C
	Gold for European	1U-2025C
	Black for U.K.	1U-2025D
	Gold for U.K.	1U-2025D

	R44 R45	D 9 D17	R74	ANT. TERMINAL	POWER TRANS.	AC CORD
Europe/U.K.	15k	NONE	NONE	2050603002	2335798001	Europe: 206207300 U.K. : 206207400
Canada	5.6k	YES	YES	2050603015	2335799000	2062060002
Australia	↑	NONE	NONE	2050603002	2335798001	2062025005
Multivoltage	↑	YES	NONE	2050603015	2335801008	2006031026



AC CORD
2062073002
2062074001
062060002
062025005
006031026

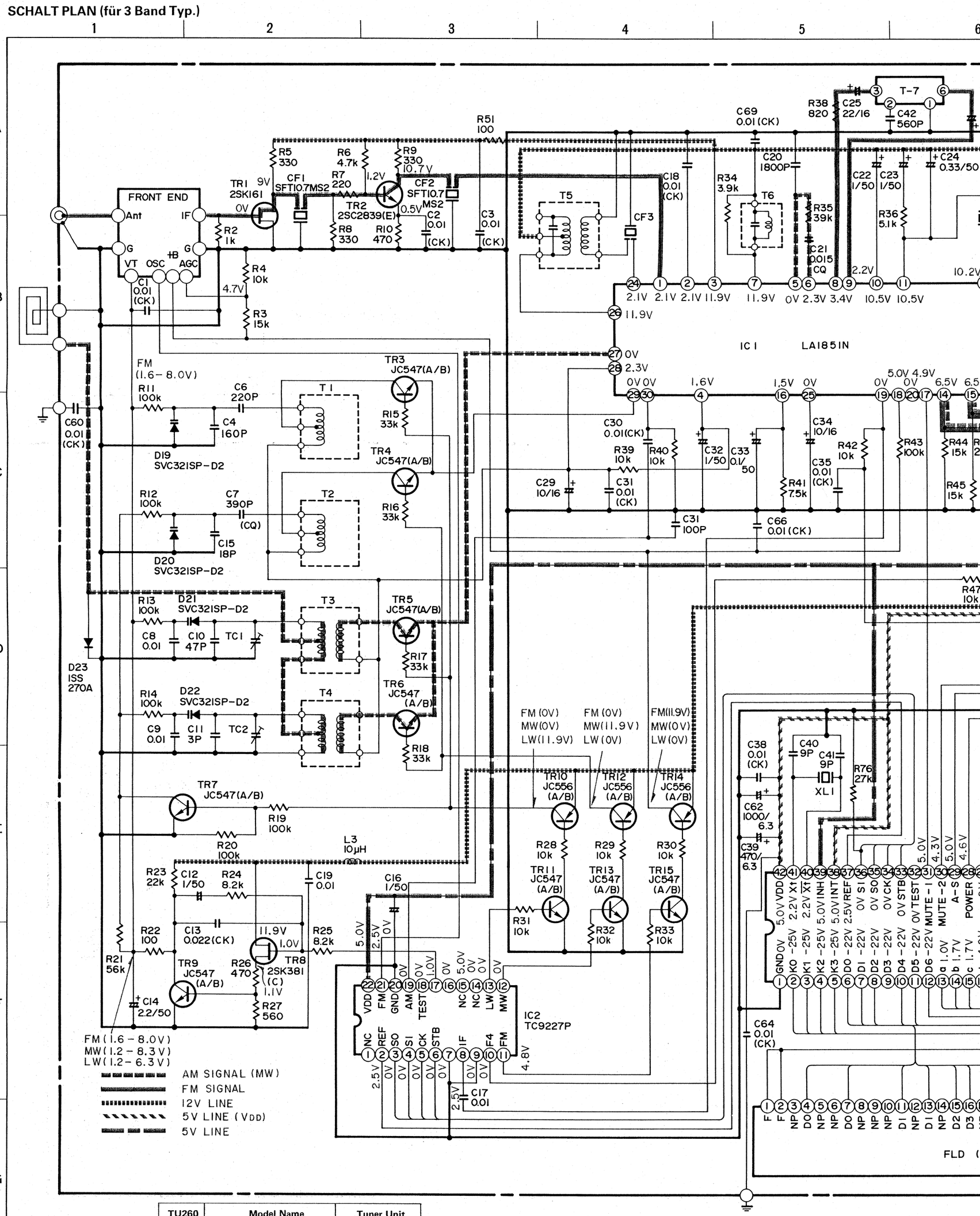
ACHTUNG:
Mit ⚠ ▨ markierte Teile haben kritische Eigenschaften und dürfen NUR gegen vom Hersteller empfohlene Teile ausgetauscht werden.

SICHERHEITSHINWEIS:
Vor der Rückgabe des Gerätes an den Kunden unbedingt entweder eine Leckstromkontrolle oder eine Prüfung des Widerstands zwischen Netz und Chassis durchführen. Das Gerät ist defekt bei Leckströmen über 0,5 Milliampere oder einem Widerstand von weniger als 240 Kiloohm zwischen Chassis und einer Netzphase.

ACHTUNG:
NIEMALS das Gerät dem Kunden zurückgeben, solange diese Störung nicht erkannt und beseitigt ist.

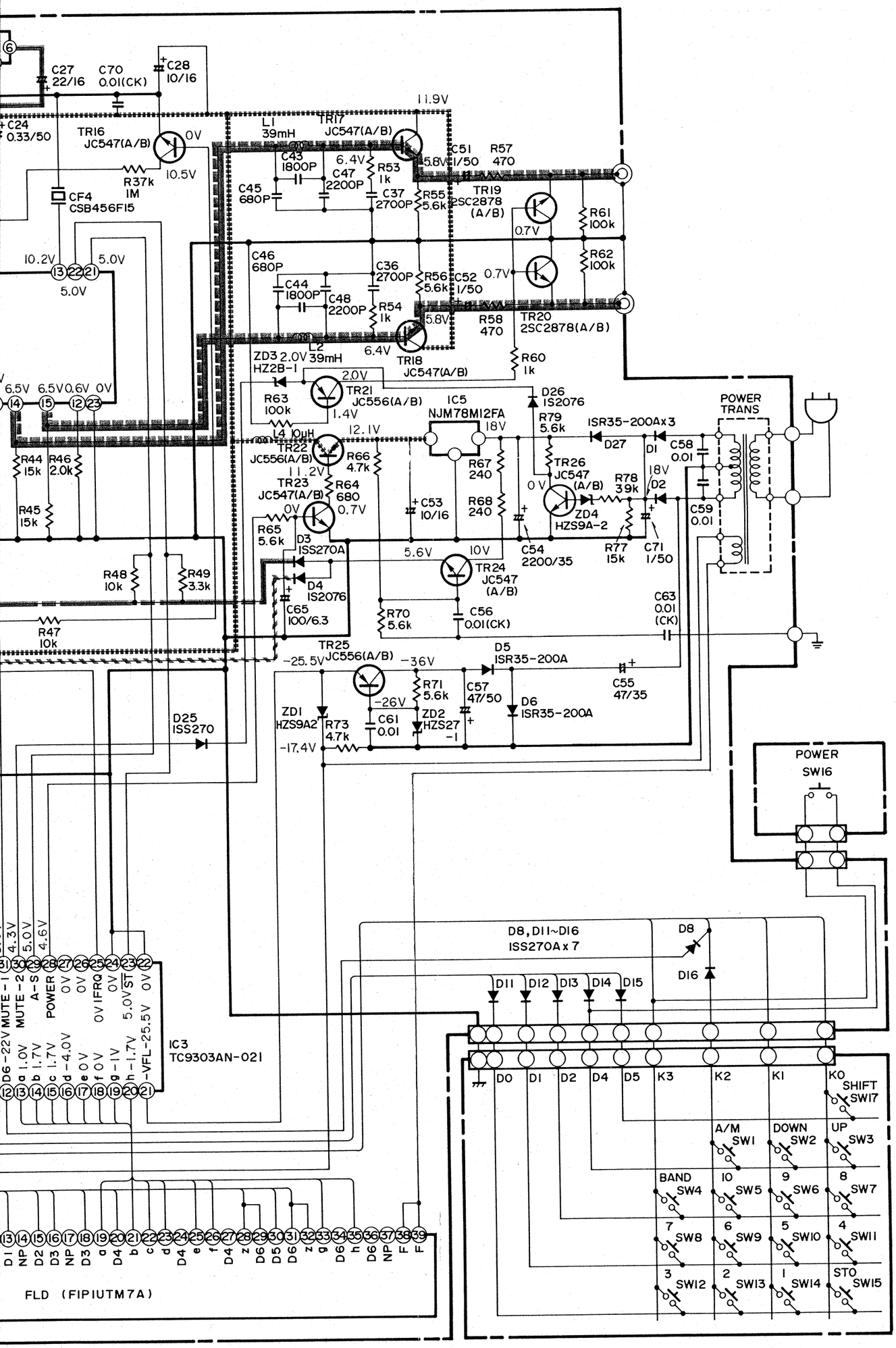
Anmerkungen:
Alle Widerstandswerte in Ohm, K = 1000 Ohm, M = 1 000 000 Ohm
Alle Kapazitätswerte in Mikrofarad, P = Picofarad
Alle Spannungen und Ströme ohne Eingangssignal gemessen.
Änderungen bezüglich Schaltung und Bauelemente vorbehalten.

SCHALT PLAN (für 3 Band Typ.)



TU260	Model Name	Tuner Unit
2 Band	Black for European	1U-2025
	Gold for European	1U-2025
	Black for Canada	1U-2025B
	Black for Multi Voltage	1U-2025E
	Black for Australia	1U-2025F
3 Band	Black for European	1U-2025C
	Gold for European	1U-2025C
	Black for U.K.	1U-2025D
	Gold for U.K.	1U-2025D

	R44 R45	D 9 D17	R74	ANT. TERMINAL	POWER TRANS.	
Europe/U.K.	15k	NONE	NONE	2050603002	2335798001	Eur U.K
Canada	5.6k	YES	YES	2050603015	2335799000	
Australia	↑	NONE	NONE	2050603002	2335798001	
Multivoltage	↑	YES	NONE	2050603015	2335801008	



ANS.	AC CORD
01	Europe: 2062073002 U.K. : 2062074001
00	2062060002
01	2062025005
08	2006031026

ACHTUNG:
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ACHTUNG:
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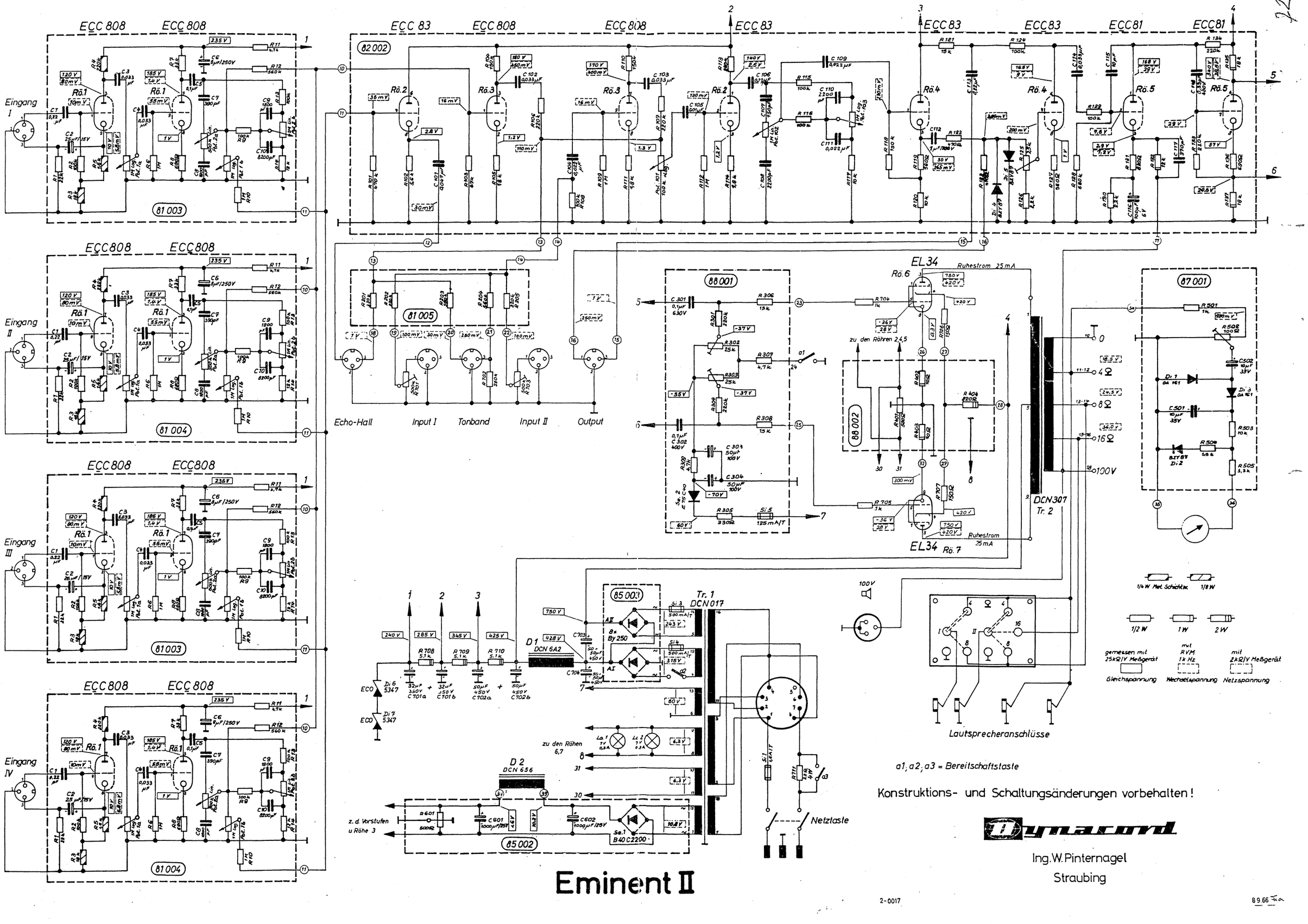
Anmerkungen:
Alle Widerstandswerte in Ohm, K = 1000 Ohm, M = 1 000 000 Ohm
Alle Kapazitätswerte in Mikrofarad, P = Picofarad
Alle Spannungen und Ströme ohne Eingangssignal gemessen.
Änderungen bezüglich Schaltung und Bauelemente vorbehalten.



a1; a2; a3 = Bereitschaftstaste

Konstruktions- und Schaltungsänderungen vorbehalten!

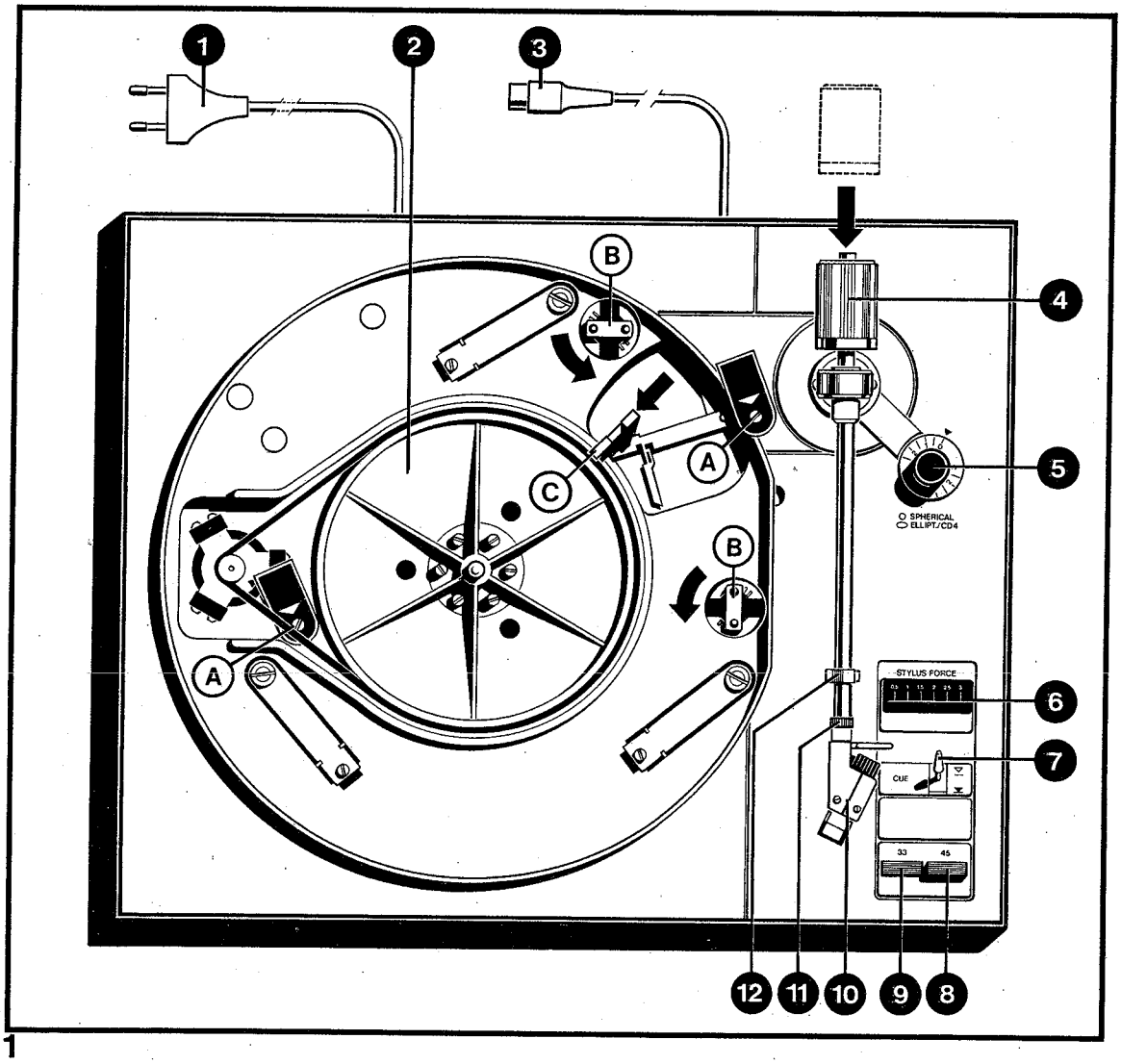
Eminent II

Dynacord

Ing. W. Pinternagel
Straubing

2-0017

8.9.66


1
2
3
B
A
C
B
A
4
5
SPHERICAL
ELLIPT./CD4
STYLUS FORCE
6
7
CUE
33
45
12
11
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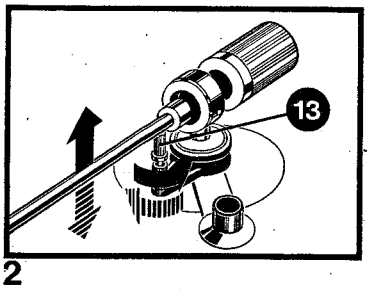
8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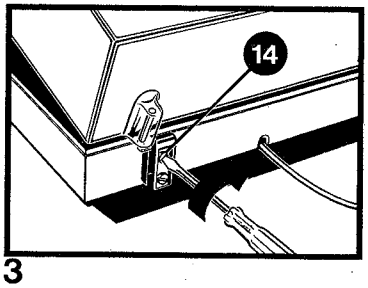
2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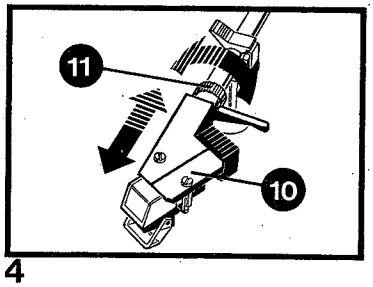
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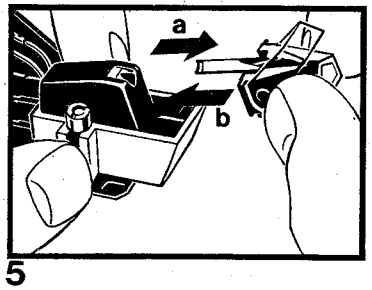
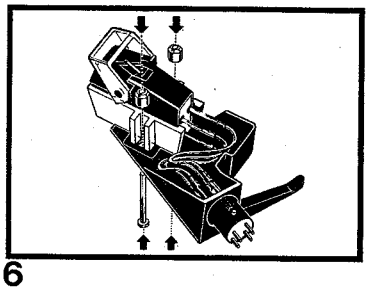
4


a
b

5



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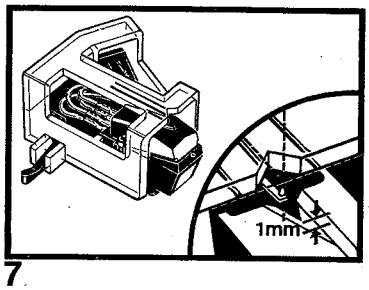
1mm

7

English

This HiFi record player . . .

. . . is equipped with 'DIRECT CONTROL', a completely new type of drive system combining the advantages of both belt and direct drive systems and ensuring absolutely constant turntable speed with negligible wow and flutter.
The prime mover is a d.c. motor which drives the turntable/tachometer assembly via a precision ground belt. The tachometer continuously monitors the turntable speed, which it feeds to an electronic circuit. This compares the signal from the tachometer to an extremely stable reference signal.
Should any difference be found, a control signal is immediately triggered, the action of which is to adjust the power supply to the motor so that the correct turntable speed is instantly obtained. Mains voltage or temperature fluctuations and varying frictional forces arising from, say, the use of a cleaning arm thus have minimal effect on the turntable speed.
Other features of this record player in addition to its unique drive system are:
- Extremely low rumble, thanks to the independent suspension of the turntable and pick-up arm.
- Adjustable stylus force and side-thrust compensation.
- Viscosity damped pick-up arm lift.
- Automatic return of the pick-up arm to its rest at the end of the record.

Controls etc.

Fig. 1
① mains plug (not fitted to all versions)
② driving disc/tachometer assembly
③ connecting cable
④ counterweight
⑤ knob for adjustment of side-thrust compensation
⑥ stylus force indicator
⑦ pick-up arm cue lever
⑧ 45-rpm key
⑨ 33-rpm key
⑩ pick-up headshell
⑪ coupling ring for headshell attachment
⑫ pick-up arm lock
Ⓐ transportation screw
Ⓑ transportation locking swivels
Ⓒ transportation clamp

Fig. 2
⑬ screw for adjustment of lift height

Fig. 3
⑭ screws for adjustment of cover hinges

Installation

Mains voltage
Check that the mains voltage to which the apparatus has been set, which is indicated on the type plate on the base, is the same as that of your mains supply.
If it is not, ask your dealer or service organization to alter the setting.

Transport safeguards
The sub-chassis (the independently suspended unit consisting of the turntable and the pick-up arm) is locked in position by the screws Ⓐ and the swivels Ⓑ to protect it against shocks during transportation. The bracket of the starting mechanism is locked with clamp Ⓒ. Also some parts of the apparatus may have cardboard and/or plastic protective material.
Before fitting the turntable, release the sub-chassis by removing the screws Ⓐ and turning the locking swivels Ⓑ (anti-clockwise) free of the top plate. To release the starting mechanism, remove clamp Ⓒ by pressing in the direction indicated. Any protective material must also be removed.
Whenever the record player is to be transported, first lock the sub-chassis in position by turning the swivels Ⓑ clockwise to their limit.

Assembly
The turntable, the counterweight and the adapter for 45-rpm records are packed separately.
Place the turntable in position over the spindle of the driving disc/tachometer assembly ②.
Screw counterweight ④, as shown in Fig. 1, onto the end of the pick-up arm as far as it will go.

Adjustment of the stylus force and the side-thrust compensation
Stylus force is the vertical force which is exerted downwards by the stylus on the record. Each type of cartridge has its own optimum stylus force, the value in each case being shown in the technical data supplied with the cartridge. It is of the utmost importance that the stylus force should be precisely adjusted as recommended, since a force which is too high or too low can impair the sound quality and damage your records. Stylus force is expressed in grams force (gf; 1 gf = 10 mN). It is adjusted by means of counterweight ④ and can be read directly from stylus force indicator ⑥.
Side thrust is the force which, generated by the friction of the stylus in contact with the walls of the

groove, tends to press the stylus more strongly against the inner wall and thus gives rise to sound distortion. The side thrust depends on the stylus force and the shape of the stylus. This record player incorporates a system for side-thrust compensation, the level of which is adjusted by means of knob ⑤. This has two scales. The black scale, with a small white triangle as reference point, is for pick-up cartridges with a spherical stylus (e.g. Philips SUPER M II cartridge GP 400 II). The orange scale, with a small orange triangle as reference point, is for cartridges with either a bi-radial stylus (e.g. Philips SUPER M II cartridge GP 401 II or GP 412 II) or a CD4 stylus (e.g. Philips SUPER M II cartridge GP 422 II). The side-thrust compensation must be set to correspond to the same value as the stylus force.

Proceed as follows:

- Check that adjusting knob ⑤ is at '0'.
- Place cue lever ⑦ to '▼'.
- Release the pick-up arm by pressing lock ⑫ to the right.
- With one hand, support the pick-up arm above the arm rest. With the other hand, unscrew counterweight ④ until the green line of stylus force indicator ⑥ denotes the desired stylus force when the pick-up arm is laid on the rest. For cartridge GP 400 II, with which most versions of this record player are provided, the reading should be '2'.
- Turn adjusting knob ⑤ until the desired value on the scale concerned is opposite the corresponding small triangle. For cartridge GP 400 II the reading should be '2' on the black scale.

Connection

- Insert mains plug ① in the room socket.

As the record player does not have a mains switch, the mains plug should be withdrawn from the room socket when the apparatus is left unused for holidays or similar long periods.

Important note (U.K. only)

The wires in the mains lead are coloured in accordance with the following code:

Blue - Neutral Brown - Live

As these colours may not correspond with the colour markings identifying the terminals in your plug proceed as follows: The Brown wire must be connected to the terminal which is marked with the letter L or coloured Red.

The Blue wire must be connected to the terminal which is marked with the letter N or coloured Black.

Note: This apparatus must be protected by a 3 amp Fuse if a 13 amp plug is used, or if any other type of plug is used by a 5 amp Fuse either in the plug or adapter, or at the distribution board. If in doubt consult a qualified electrician.

- Connect cable ③ to the input on your amplifier for magnetodynamic pick-up cartridges.

Operation

- Carefully swing up the stylus guard.
- Free the pick-up arm by pressing lock ⑫ to the right.
- Select the speed desired by pressing either key ⑧ (45 rpm) or ⑨ (33 rpm).
- Place cue lever ⑦ to '▽'.
- Switch on the record player and start the turntable by lifting the pick-up arm from its rest and bringing it into position above the desired part of the record.
- Place cue lever ⑦ to '▼'; the pick-up arm now descends on to the record.
- At the end of the record the pick-up arm returns to its rest and the record player is switched off. When you have finished playing records, lock the pick-up arm in place by pressing lock ⑫ to the left.

Interruption of play

Place cue lever ⑦ to '▽'. The pick-up arm rises from the record and the turntable continues to rotate. To resume playing, return the cue lever to '▼'.

Stopping during play

Place cue lever ⑦ to '▽' and lay the pick-up arm by hand on its rest.

Maintenance

General

As the mechanism of the record player has self-lubricating bearings, it requires no maintenance. Although the diamond stylus of a SUPER M II cartridge wears very slowly, it is advisable to have it checked at regular intervals, e.g. twice a year. In this way it can be replaced if necessary in good time. Dust and hairs can be removed from the stylus with a small, soft-haired brush, which should be stroked over the stylus in a direction moving from rear to front of the cartridge. More obstinate deposits can be removed if the brush is moistened with a little cleaning spirit.

Adjusting the lift height

Should the pick-up arm not return correctly to the arm rest, the lift height - the height to which the arm is raised - can be increased.

- Swing up the stylus guard.
- Place cue lever ⑦ to '▽'.
- Place the pick-up arm over the record.
- Turn adjustment screw ⑬ (Fig. 2) anti-clockwise until the required lift height is obtained. Do not turn

the screw too far, however, for, with the stylus on the record, a clearance of about 0.5 mm (1/50″) must remain between the top of the screw and the pick-up arm.
The lift height can be reduced, if desired, by turning the screw clockwise. Here as well, the screw must not be turned too far, since, with the cue lever at '▽', the stylus must be not less than 6 mm (7/32″) above the record if the arm is to return correctly.

Adjusting the cover hinges (for equipment with cover only)
As the cover is fitted with friction hinges, it can remain open in practically any position. If the effect of the friction decreases, adjust the hinges by tightening the screws ⑭ (Fig. 3) a little.
The hinges must not be lubricated.

Cartridge
Headshell ⑩ is attached to the pick-up arm by coupling ring ⑪. In order to check or replace the stylus or the cartridge, unscrew the ring and withdraw the headshell carefully from the arm (Fig. 4).
To secure the headshell to the arm, press it gently into the arm and turn the coupling ring. The headshell is automatically aligned by its guide pins and notches.

Replacing the stylus
The stylus of a SUPER M II cartridge is mounted in a stylus carrier, which is slid into the cartridge body. When the stylus is worn out, therefore, you need to replace only the stylus carrier and not the whole cartridge.
In replacing, hold the headshell upside down in one hand and, with the thumb and index finger of the other hand, withdraw the stylus carrier carefully and in a straight line from the cartridge (Fig. 5, a). Then slide the new carrier into the cartridge, again moving in a straight line (Fig. 5, b).
Buy only stylus carriers bearing the name PHILIPS *on the stylus guard and packaging. Only in this way can the quality of the original cartridge be maintained.*

Replacing the cartridge
Only SUPER M II cartridges can be attached to headshell ⑩. The position of the cartridge on the headshell is accurately determined by the area outlined on the inner side of the headshell.
Loosen the screws securing the old cartridge and carefully pull the coloured wires from the cartridge's contact pins.
First connect the coloured wires to the pins of the new cartridge as follows:

L (white) to L (left-hand channel)
R (red) to R (right-hand channel)
LG (blue) to LG (return left-hand channel)
RG (green) to RG (return right-hand channel)

Now place the cartridge in the area marked and insert the screws through the holes in the top of the headshell and the slots on both sides of the cartridge (Fig. 6). Finally, tighten the screws uniformly but not excessively.
If you wish to use a cartridge other than the SUPER M II, a different headshell is required. This can be purchased separately under code number 4822 402 60627 and is suitable for all cartridges having RETMA fixing standard (½″ - 12.7 mm). It is supplied with a jig for aligning the cartridge and with mounting hardware.
Now also first connect the coloured wires to the cartridge as described above. Then attach the cartridge loosely to the headshell using the appropriate screws and nuts.
Lay the headshell in the jig (Fig. 7), turn it over and first of all check that the clearance between the tip of the stylus and the jig is approximately 1 mm (1/25″). If the clearance is greater than this, place one or more spacers under the cartridge. Now adjust the position of the cartridge carefully until the stylus is exactly in the centre of the notch in the jig and the long sides of the cartridge are parallel with the lines on the jig. Finish by tightening the screws uniformly.

Technical data
(subject to alteration)

Turntable speeds	33⅓ and 45 rpm
Wow and flutter	
DIN	less than 0.08%
WRMS	less than 0.05%
Rumble	
DIN A	lower than −43 dB
DIN B	lower than −65 dB
Tracking error	smaller than 0°9′ /cm
Stylus force	adjustable from 1 to 3 gf
Arm friction	
horizontal	less than 15 mgf
vertical	less than 10 mgf
Mains voltage and frequency	see type plate
Power consumption	max. 3 W
Dimensions	
with cover closed	420 × 144 × 348 mm
with cover fully opened	420 × 405 × 420 mm
Weight	approx. 5 kg

The type plate will be found on the base of the apparatus

SUPER M II GP 400 II - GP 401 II - GP 412 II

	GP 400 II	GP 401 II	GP 412 II
Übertragungsbereich	20-20.000 Hz ±2 dB	20-20.000 Hz ±2 dB	20-2.000 Hz ±2 dB
Übertragungsfaktor (1 kHz)	1,3 mV/cm/sec	1,3 mV/cm/sec	1,5 mV/cm/sec
Unterschied des Übertragungsmaßes (1 kHz)	<2 dB	<2 dB	<1 dB
Übersprechdämpfung (1 kHz)	>29 dB	>29 dB	>30 dB
FIM-Verzerrungen	<0,9% (2 p - 20 mN)	<0,8% (1,7 p - 17 mN)	<0,7% (1,2 p - 12 mN)
Nadel (Diamant)	15 µm (sphärisch)	7×18 µm (elliptisch)	7×18 µm (elliptisch)
Nadelmasse	0,2 mg	0,2 mg	0,1 mg
Nadelauflagekraft	1,5 . . . 3 p (15 . . . 30 mN)	1,5 . . . 2,5 p (15 . . . 25 mN)	0,75 . . . 1,5 p (7,5 . . . 15 mN)
Empfohlene Nadelauflagekraft	2 p (20 mN)	1,7 p (17 mN)	1,2 p (12 mN)
Nadelnachgiebigkeit (dynamisch horizontal)	>20 mm/N	>20 mm/N	>30 mm/N
Abtastfähigkeit	>90 µm (2 p - 20 mN)	> 90 µm (1,7 p - 17 mN)	>80 µm (1,2 p - 12 mN)
Nadelträgereinheit Nr. (Ersatz)	4822 251 30048	4822 251 30049	4822 251 30051
Frequency response	20-20,000 Hz ±2 dB	20-20,000 Hz ±2 dB	20-25,000 Hz ±2 dB
Sensitivity (1 kHz)	1.3 mV/cm/sec	1.3 mV/cm/sec	1.5 mV/cm/sec
Output asymmetry (1 kHz)	<2 dB	<2 dB	<1 dB
Channel separation (1 kHz)	>29 dB	>29 dB	>30 dB
Frequency intermodulation distortion	<0.9% (2 gf - 20 mN)	<0.8% (1.7 gf - 17 mN)	<0.7% (1.2 gf - 12 mN)
Stylus (diamond)	15 µm (spherical)	7×18 µm (elliptical)	7×18 µm (elliptical)
Stylus mass	0.2 mg	0.2 mg	0.1 mg
Stylus force	1.5 . . . 3 gf (15 . . . 30 mN)	1.5 . . . 2.5 gf (15 . . . 25 mN)	0.75 . . . 1.5 gf (7.5 . . . 15 mN)
Recommended stylus force	2 gf (20 mN)	1.7 gf (17 mN)	1.2 gf (12 mN)
Dynamic compliance (lateral)	>20 mm/N	>20 mm/N	>30 mm/N
Trackability	>90 µm (2 gf - 20 mN)	>90 µm (1.7 gf - 17 mN)	>80 µm (1.2 gf - 12 mN)
Codenumber of stylus unit	4822 251 30048	4822 251 30049	4822 251 30051
Bande passante	20-20.000 Hz ±2 dB	20-20.000 Hz ±2 dB	20-25.000 Hz ±2 dB
Sensibilité (1 kHz)	1,3 mV/cm/sec	1,3 mV/cm/sec	1,5 mV/cm/sec
Asymetrie des voies (1 kHz)	<2 dB	<2 dB	<1 dB
Séparation des voies (1 kHz)	>29 dB	>29 dB	>30 dB
Distorsion d'intermodulation	<0,9% (2 gf - 20 mN)	<0,8% (1,7 gf - 17 mN)	<0,7% (1,2 gf - 12 mN)
Dimensions de la pointe	15 µm (sphérique)	7×18 µm (elliptique)	7×18 µm (elliptique)
Masse de la pointe de lecture	0,2 mg	0,2 mg	0,1 mg
Force d'appui	1,5 . . . 3 gf (15 . . . 30 mN)	1,5 . . . 2,5 gf (15 . . . 25 mN)	0,75 . . . 1,5 gf (7,5 . . . 15 mN)
Force d'appui recommandée	2 gf (20 mN)	1,7 gf (17 mN)	1,2 gf (12 mN)
Elasticité (compliance) dynamique latérale	>20 mm/N	>20 mm/N	>30 mm/N
Aptitude à la lecture	>90 µm (2 gf - 20 mN)	>90 µm (1,7 gf - 17 mN)	>80 µm (1,2 gf - 12 mN)
Référence du bloc d'équipage mobile	4822 251 30048	4822 251 30049	4822 251 30051
Risposta in frequenza	20-20.000 Hz ±2 dB	20-20.000 Hz ±2 dB	20-25.000 Hz ±2 dB
Sensibilità (1 kHz)	1,3 mV/cm/sec	1,3 mV/cm/sec	1,5 mV/cm/sec
Asimmetria in uscita (1 kHz)	<2 dB	<2 dB	<1 dB
Separazione canali (1 kHz)	>29 dB	>29 dB	>30 dB
Distorsione FIM	<0,9% (2 gf - 20 mN)	<0,8% (1,7 gf - 17 mN)	<0,7% (1,2 gf - 12 mN)
Puntina (diamante)	15 µm (conica)	7×18 µm (ellittica)	7×18 µm (ellittica)
Massa puntina	0,2 mg	0,2 mg	0,1 mg
Pressione d'appoggio	1,5 . . . 3 gf (15 . . . 30 mN)	1,5 . . . 2,5 gf (15 . . . 25 mN)	0,75 . . . 1,5 gf (7,5 . . . 15 mN)
Pressione consigliata	2 gf (20 mN)	1,7 gf (17 mN)	1,2 gf (12 mN)
Cedevolezza dinamica (orizzontale)	>20 mm/N	>20 mm/N	>30 mm/N
Tracciabilità	>90 µm (2 gf - 20 mN)	>90 µm (1,7 gf - 17 mN)	>80 µm (1,2 gf - 12 mN)
Codice puntina	4822 251 30048	4822 251 30049	4822 251 30051
Frequentiebereik	20-20.000 Hz ±2 dB	20-20.000 Hz ±2 dB	20-25.000 Hz ±2 dB
Gevoeligheid (1 kHz)	1,3 mV/cm/sec	1,3 mV/cm/sec	1,5 V/cm/sec
Kanaalasymmetrie (1 kHz)	<2 dB	<2 dB	<1 dB
Kanaalscheiding (1 kHz)	>29 dB	>29 dB	>30 dB
FIM-vervorming	<0,9% (2 gf - 20 mN)	<0,8% (1,7 gf - 17 mN)	<0,7% (1,2 gf - 12 mN)
Naaldpunt (diamant)	15 µm (sferisch)	7×18 µm (elliptisch)	7×18 µm (elliptisch)
Tipmassa	0,2 mg	0,2 mg	0,1 mg
Naaldkracht	1,5 . . . 3 gf (15 . . . 30 mN)	1,5 . . . 2,5 gf (15 . . . 25 mN)	0,75 . . . 1,5 gf (7,5 . . . 15 mN)
Aanbevolen naaldkracht	2 gf (20 mN)	1,7 gf (17 mN)	1,2 gf (12 mN)
Dynamische compliantie (horiz.)	>20 mm/N	>20 mm/N	>30 mm/N
Spooreigenschappen	>90 µm (2 gf - 20 mN)	>90 µm (1,7 gf - 17 mN)	>80 µm (1,2 gf - 12 mN)
Codenummer remplace-naald	4822 251 30048	4822 251 30049	4822 251 30051

SUPER M II GP 400 II - GP 401II - GP 412 II

	GP 400 II	GP 401 II	GP 412 II
Frekvensomfång	20-20000 Hz ±2 dB	20-20000 Hz ±2 dB	20-25000 Hz ±2 dB
Känslighet (1 kHz)	1,3 mV/cm/sec	1,3 mV/cm/sec	1,5 mV/cm/sec
Nivåskillnad mellan kanalerna (1 kHz)	<2 dB	<2 dB	<1 dB
Kanalseparation (1 kHz)	>29 dB	>29 dB	>30 dB
FIM-distorsion (Frequency Intermodulation)	<0,9% (2 gf - 20 mN)	<0,8% (1,7 gf - 17 mN)	<0,7% (1,2 gf - 12 mN)
Nål (diamant)	15 µm (sfärisk)	7×18 µm (elliptisk)	7×18 µm (elliptisk)
Nålmassa	0,2 mg	0,2 mg	0,1 mg
Nåltryck	1,5 . . . 3 gf (15 . . . 30 mN)	1,5 . . . 2,5 gf (15 . . . 25 mN)	0,75 . . . 1,5 gf (7,5 . . . 15 mN)
Rekommenderat nåltryck	2 gf (20 mN)	1,7 gf (17 mN)	1,2 gf (12 mN)
Fjädringsmjukhet	>20 mm/N	>20 mm/N	>30 mm/N
Följsamhet	>90 µm (2 gf - 20 mN)	>90 µm (1,7 gf - 17 mN)	>80 µm (1,2 gf - 12 mN)
Nål - kodnummer	4822 251 30048	4822 251 30049	4822 251 30051
Frekvensområde	20-20.000 Hz ±2 dB	20-20.000 Hz ±2 dB	20-25.000 Hz ±2 dB
Følsomhet (1 kHz)	1,3 mV/cm/sec	1,3 mV/cm/sec	1,5 mV/cm/sec
Utgangsasymmetri (1 kHz)	<2 dB	<2 dB	<1 dB
Kanalseparasjon (1 kHz)	>29 dB	>29 dB	>30 dB
FIM forvrengning	<0,9% (2 gf - 20 mN)	<0,8% (1,7 gf - 17 mN)	<0,7% (1,2 gf - 12 mN)
Stift (diamant)	15 µm (rund)	7×18 µm (elliptisk)	7×18 µm (elliptisk)
Stiftmasse	0,2 mg	0,2 mg	0,1 mg
Stifttrykk	1,5 . . . 3 gf (15 . . . 30 mN)	1,5 . . . 2,5 gf (15 . . . 25 mN)	0,75 . . . 1,5 gf (7,5 . . . 15 mN)
Anbefalt stifttrykk	2 gf (20 mN)	1,7 gf (17 mN)	1,2 gf (12 mN)
Dynamisk bevegelighet (horisontal)	>20 mm/N	>20 mm/N	>30 mm/N
Sporingsevne	>90 µm (2 gf - 20 mN)	>90 µm (1,7 gf - 17 mN)	>80 µm (1,2 gf - 12 mN)
Kodenummer på stift enhet	4822 251 30048	4822 251 30049	4822 251 30051
Frekvensområde	20-20.000 Hz ±2 dB	20-20.000 Hz ±2 dB	20-25.000 Hz ±2 dB
Følsomhed (1 kHz)	1,3 mV/cm/sec	1,3 mV/cm/sec	1,5 mV/cm/sec
Symetri (1 kHz)	<2 dB	<2 dB	<1 dB
Kanaladskillelse (1 kHz)	>29 dB	>29 dB	>30 dB
Forvrængning (FIM)	<0,9% (20 mN - 2 gf)	<0,8% (17 mN - 1,7 gf)	<0,7% (12 mN - 1,2 gf)
Nål (diamant)	15 µm (sfærisk)	7×18 µm (elliptisk)	7×18 µm (elliptisk)
Nålemasse	0,2 mg	0,2 mg	0,1 mg
Nåletryk	15 . . . 30 mN (1,5 . . . 3 gf)	15 . . . 25 mN (1,5 . . . 2,5 gf)	7,5 . . . 15 mN (0,75 . . . 1,5 gf)
Anbefalet nåletryk	20 mN (2 gf)	17 mN (1,7 gf)	12 mN (1,2 gf)
Dynamisk compliance (horisontal)	>20 mm/N	>20 mm/N	>30 mm/N
Trackability	>90 µm (20 mN - 2 gf)	>90 µm (17 mN - 1,7 gf)	>80 µm (12 mN - 1,2 gf)
Kodenummer på nåleenhed	4822 251 30048	4822 251 30049	4822 251 30051
Toistoalue	20-20.000 Hz ±2 dB	20-20.000 Hz ±2 dB	20-25.000 Hz ±2 dB
Herkkyys (1 kHz)	1,3 mV/cm/sec	1,3 mV/cm/sec	1,5 mV/cm/sec
Kanavatasapaino (1 kHz)	<2 dB	<2 dB	<1 dB
Kanavaerotus (1 kHz)	>29 dB	>29 dB	>30 dB
Keskeismodulaatiosärö	<0,9% (20 mN - 2 p)	<0,8% (17 mN - 1,7 p)	<0,7% (12 mN - 1,2 p)
Neula (timantti)	15 µm (pyöreä)	7×18 µm (elliptinen)	7×18 µm (elliptinen)
Tehollinen neulamassa	0,2 mg	0,2 mg	0,1 mg
Neularasko	15 . . . 30 mN (1,5 . . . 3 p)	15 . . . 25 mN (1,5 . . . 2,5 p)	7,5 . . . 15 mN (0.75 . . . 1,5 p)
Suositeltava neularasko	20 mN (2 p)	17 mN (1,7 p)	12 mN (1,2 p)
Joustavuus (vaakatasossa)	>20 mm/N	>20 mm/N	>30 mm/N
Seurantakyky	>90 µm (20 mN - 2 p)	>90 µm (17 mN - 1,7 p)	>80 µm (12 mN - 1,2 p)
Tilauskoodi	4822 251 30048	4822 251 30049	4822 251 30051
Respuesta de frecuencia	20-20.000 Hz ±2 dB	20-20.000 Hz ±2 dB	20-25.000 Hz ±2 dB
Sensibilidad (1 kHz)	1,3 mV/cm/sec	1,3 mV/cm/sec	1,5 mV/cm/sec
Asimetría de salida (1 kHz)	<2 dB	<2 dB	<1 dB
Separación de canales (1 kHz)	>29 dB	>29 dB	>30 dB
Distorsión de intermodulación de frecuencia	<0,9% (2 gf - 20 mN)	<0,8% (1,7 gf - 17 mN)	<0,7% (1,2 gf - 12 mN)
Aguja (diamante)	15 µm (esférica)	7×18 µm (elíptica)	7×18 µm (elíptica)
Masa de la aguja	0,2 mg	0,2 mg	0,1 mg
Presión de la aguja	1,5 . . . 3 gf (15 . . . 30 mN)	1,5 . . . 2,5 gf (15 . . . 25 mN)	0,75 . . . 1,5 gf (7,5 . . . 15 mN)
Presión de la aguja aconsejada	2 gf (20 mN)	1,7 gf (17 mN)	1,2 gf (12 mN)
Elasticidad dinámica (horizontal)	>20 mm/N	>20 mm/N	>30 mm/N
Seguimiento del surco	>90 µm (2 gf - 20 mN)	>90 µm (1,7 gf - 17 mN)	>80 µm (1,2 gf - 12 mN)
Número de código de la unidad de aguja	4822 251 30048	4822 251 30049	4822 251 30051

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SUPER M II GP 400 II - GP 401II - GP 412 II

	GP 400 II	GP 401 II	GP 412 II
Frekvensomfång	20–20000 Hz ±2 dB	20–20000 Hz ±2 dB	20–25000 Hz ±2 dB
Känslighet (1 kHz)	1,3 mV/cm/sec	1,3 mV/cm/sec	1,5 mV/cm/sec
Nivåskillnad mellan kanalerna (1 kHz)	<2 dB	<2 dB	<1 dB
Kanalseparation (1 kHz)	>29 dB	>29 dB	>30 dB
FIM-distorsion (Frequency Intermodulation)	<0,9% (2 gf - 20 mN)	<0,8% (1,7 gf - 17 mN)	<0,7% (1,2 gf - 12 mN)
Nål (diamant)	15 µm (sfärisk)	7×18 µm (elliptisk)	7×18 µm (elliptisk)
Nålmassa	0,2 mg	0,2 mg	0,1 mg
Nältryck	1,5 . . . 3 gf (15 . . . 30 mN)	1,5 . . . 2,5 gf (15 . . . 25 mN)	0,75 . . . 1,5 gf (7,5 . . . 15 mN)
Rekommenderat nåltryck	2 gf (20 mN)	1,7 gf (17 mN)	1,2 gf (12 mN)
Fjädringsmjukhet	>20 mm/N	>20 mm/N	>30 mm/N
Följsamhet	>90 µm (2 gf - 20 mN)	>90 µm (1,7 gf - 17 mN)	>80 µm (1,2 gf - 12 mN)
Nål - kodnummer	4822 251 30048	4822 251 30049	4822 251 30051

Frekvensområde	20–20.000 Hz ±2 dB	20–20.000 Hz ±2 dB	20–25.000 Hz ±2 dB
Følsomhet (1 kHz)	1,3 mV/cm/sec	1,3 mV/cm/sec	1,5 mV/cm/sec
Utgangsasymmetri (1 kHz)	<2 dB	<2 dB	<1 dB
Kanalseparasjon (1 kHz)	>29 dB	>29 dB	>30 dB
FIM forvrengning	<0,9% (2 gf - 20 mN)	<0,8% (1,7 gf - 17 mN)	<0,7% (1,2 gf - 12 mN)
Stift (diamant)	15 µm (rund)	7×18 µm (elliptisk)	7×18 µm (elliptisk)
Stiftmasse	0,2 mg	0,2 mg	0,1 mg
Stifttrykk	1,5 . . . 3 gf (15 . . . 30 mN)	1,5 . . . 2,5 gf (15 . . . 25 mN)	0,75 . . . 1,5 gf (7,5 . . . 15 mN)
Anbefalt stifttrykk	2 gf (20 mN)	1,7 gf (17 mN)	1,2 gf (12 mN)
Dynamisk bevegelighet (horisontal)	>20 mm/N	>20 mm/N	>30 mm/N
Sporingsevne	>90 µm (2 gf - 20 mN)	>90 µm (1,7 gf - 17 mN)	>80 µm (1,2 gf - 12 mN)
Kodenummer på stift enhet	4822 251 30048	4822 251 30049	4822 251 30051

Frekvensområde	20–20.000 Hz ±2 dB	20–20.000 Hz ±2 dB	20–25.000 Hz ±2 dB
Følsomhed (1 kHz)	1,3 mV/cm/sec	1,3 mV/cm/sec	1,5 mV/cm/sec
Symetri (1 kHz)	<2 dB	<2 dB	<1 dB
Kanaladskillelse (1 kHz)	>29 dB	>29 dB	>30 dB
Forvrængning (FIM)	<0,9% (20 mN - 2 gf)	<0,8% (17 mN - 1,7 gf)	<0,7% (12 mN - 1,2 gf)
Nål (diamant)	15 µm (sfærisk)	7×18 µm (elliptisk)	7×18 µm (elliptisk)
Nålemasse	0,2 mg	0,2 mg	0,1 mg
Nåletryk	15 . . . 30 mN (1,5 . . . 3 gf)	15 . . . 25 mN (1,5 . . . 2,5 gf)	7,5 . . . 15 mN (0,75 . . . 1,5 gf)
Anbefalet nåletryk	20 mN (2 gf)	17 mN (1,7 gf)	12 mN (1,2 gf)
Dynamisk compliance (horisontal)	>20 mm/N	>20 mm/N	>30 mm/N
Trackability	>90 µm (20 mN - 2 gf)	>90 µm (17 mN - 1,7 gf)	>80 µm (12 mN - 1,2 gf)
Kodenummer på nåleenhed	4822 251 30048	4822 251 30049	4822 251 30051

Toistoalue	20–20.000 Hz ±2 dB	20–20.000 Hz ±2 dB	20–25.000 Hz ±2 dB
Herkkyys (1 kHz)	1,3 mV/cm/sec	1,3 mV/cm/sec	1,5 mV/cm/sec
Kanavatasapaino (1 kHz)	<2 dB	<2 dB	<1 dB
Kanavaerotus (1 kHz)	>29 dB	>29 dB	>30 dB
Keskeismodulaatiosärö	<0,9% (20 mN - 2 p)	<0,8% (17 mN - 1,7 p)	<0,7% (12 mN - 1,2 p)
Neula (timantti)	15 µm (pyöreä)	7×18 µm (elliptinen)	7×18 µm (elliptinen)
Tehollinen neulamassa	0,2 mg	0,2 mg	0,1 mg
Neularasko	15 . . . 30 mN (1,5 . . . 3 p)	15 . . . 25 mN (1,5 . . . 2,5 p)	7,5 . . . 15 mN (0.75 . . . 1,5 p)
Suositeltava neularasko	20 mN (2 p)	17 mN (1,7 p)	12 mN (1,2 p)
Joustavuus (vaakatasossa)	>20 mm/N	>20 mm/N	>30 mm/N
Seurantakyky	>90 µm (20 mN - 2 p)	>90 µm (17 mN - 1,7 p)	>80 µm (12 mN - 1,2 p)
Tilauskoodi	4822 251 30048	4822 251 30049	4822 251 30051

Respuesta de frecuencia	20–20.000 Hz ±2 dB	20–20.000 Hz ±2 dB	20–25.000 Hz ±2 dB
Sensibilidad (1 kHz)	1,3 mV/cm/sec	1,3 mV/cm/sec	1,5 mV/cm/sec
Asimetría de salida (1 kHz)	<2 dB	<2 dB	<1 dB
Separación de canales (1 kHz)	>29 dB	>29 dB	>30 dB
Distorsión de intermodulación de frecuencia	<0,9% (2 gf - 20 mN)	<0,8% (1,7 gf - 17 mN)	<0,7% (1,2 gf - 12 mN)
Aguja (diamante)	15 µm (esférica)	7×18 µm (elíptica)	7×18 µm (elíptica)
Masa de la aguja	0,2 mg	0,2 mg	0,1 mg
Presión de la aguja	1,5 . . . 3 gf (15 . . . 30 mN)	1,5 . . . 2,5 gf (15 . . . 25 mN)	0,75 . . . 1,5 gf (7,5 . . . 15 mN)
Presión de la aguja aconsejada	2 gf (20 mN)	1,7 gf (17 mN)	1,2 gf (12 mN)
Elasticidad dinámica (horizontal)	>20 mm/N	>20 mm/N	>30 mm/N
Seguimiento del surco	>90 µm (2 gf - 20 mN)	>90 µm (1,7 gf - 17 mN)	>80 µm (1,2 gf - 12 mN)
Número de código de la unidad de aguja	4822 251 30048	4822 251 30049	4822 251 30051

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